Form A (9/77)
Philip Morris USA

Date: _____

PM #: _____

INVENTION RECORD

TO: Patent Counsel

Preliminary Disclosure for Consideration of Patentability

1. DESCRIPTION OF THE INVENTION (in sufficient detail for the invention to be understood; please identify or attach copies of any reports, notebook pages, or other documents containing particular examples or other pertinent data): The invention would involve two manipulations. The first would involve the isolation of the genetic sequences, of microbial species, which code for enzymes specific for the degradation of nicotine and related compounds. Those catabolic genetic sequences would then be incorporated into the tobacco genome so as to allow plants modified in this manner to degrade **in situ**, endogenously produced nicotine.
See attachments for references.

2. OBJECTS/ADVANTAGES OF THE INVENTION:
These modifications would result in a tobacco plant with reduced levels of nicotine and related nicotine metabolites. It would make post-harvesting processes to lower nicotine levels in filler unnecessary.

3. STATE OF THE ART (list any known patents or publications that seem pertinent): See attachments for references.

4. HAS THERE BEEN A DISCLOSURE OF THE INVENTION TO ANYONE OUTSIDE THE COMPANY? IF SO, EXPLAIN.

The concepts involved with these minipulations have, in part, been discussed with Dr. Mark Conkling, North Carolina State University. Dr. Conkling had signed a Philip Morris Disclosure Agreement prior to those discussions.

Submitted by: _____

Location: _____

Manager's Signature: _____

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Source: https://www.industrydocuments.ucsf.edu/docs/ftvl0000

Form A (9/77)
Philip Morris USA

Date: _____

PM #: _____

Attachments

Attachement to item #1

1. Malik, V. S., Notebook No. 8899, pp. 30-32.

2. Malik, V. S., Memo to J. I. Seeman, Microbial Degradation of Nicotine by a Continuous and/or Fed-Batch Process, 31-July-1990.

3. Davies, B. D., Notebook No. 8638, p. 162.

Attachment to Item #2

1. Brandsch, R., Hinkkanen, A. E., and K. Decker, Plasmid-Mediated Nicotine Degradation in **Arthrobacter oxidans**, Arch. Microbiol, Vol. 132, pp. 26-30, 1982.

2. Brandsch, R., Hinkkanen, A. E., Mauch, L., Nagursky, H., and K. Decker, 6-Hydroxy-D-Nicotine Oxidase of **Arthrobacter oxidans**: Gene Structure of the Flavoenzyme and its Relationship to 6-Hydroxy-L-Nicotine Oxidase, Eur. J. Biochem., Vol. 167, pp. 315-320, 1987.

3. Thacker, R., Rorvig, O., Kahlon, P., and I. C. Gunsalus, NIC, a Conjugative Nicotine-Nicotinate Degradative Plasmid in **Pseudomonas convexa**, J. of Bacteriology, Vol. 135, pp. 289-290, 1978.

4. Brandsch, R., Faller, W., and K. Schneider, Plasmid pAO1 of **Arthrobacter oxidans** Encodes 6-Hydroxy-D-Nicotine Oxidase: Cloning and expression of the gene in **Escherichia coli**, Mol. Gen. Genet., Vol. 202, pp. 96-101, 1986.

5. Gravely, L. E., Geiss, V. L., and C. F. Gregory, Process for Reduction of Nitrate and Nicotine Content of Tobacco by Microbial Treatment, U.S. Patent No. 4,557,280, 1985.

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Source: https://www.industrydocuments.ucsf.edu/docs/ftvl0000

Form A (9/77)
Philip Morris USA

Date: _____

PM #: _____

INVENTION RECORD

TO: Patent Counsel, Richmond

The following background information and additional details are submitted concerning the invention described below (or to supplement an earlier preliminary disclosure on form A).

1. DESCRIPTIVE TITLE OR SUMMARY OF THE INVENTION: _____

2. FIRST DISCLOSURE TO ANYONE ELSE (specify where, when, and to whom, and whether written or oral): _____

3. FIRST WRITTEN DESCRIPTION OR SKETCH (specify dates, records and their location): _____

4. FIRST PRACTICE OF THE INVENTION--(A) LABORATORY, (B) PLANT, (C) ELSEWHERE (specify dates, records relied on and their location): _____

5. WITNESSES TO PRACTICE OF THE INVENTION (specify names, places, and dates):

6. HAS THE INVENTION BEEN DISCLOSED OUTSIDE THE CORPORATION? (specify): _____

7. OBJECTS OF THE INVENTION (what the invention is intended to accomplish):

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8. GIVE BROAD DESCRIPTION OF INVENTION IN GENERAL TERMS. SUPPLEMENT BY GIVING DETAILED DESCRIPTION WITH PRECISE INFORMATION. INCLUDE EXAMPLES TO SHOW PREFERRED FORMS OF THE INVENTION AND AVAILABLE DATA CONCERNING UPPER AND LOWER WORKING RANGES THAT ARE PERMISSIBLE. INCLUDE ANY DATA ON LIMITING CONDITIONS. ATTACH REPORTS, DRAWINGS, OR THE LIKE. USE ADDITIONAL SHEETS IF NEEDED: _____

9. LIST ANY CLOSELY RELATED PATENTS, PATENT APPLICATIONS, PUBLICATIONS, OR OTHER ASPECTS OF POSSIBLE PRIOR ART KNOWN: _____

10. ADVANTAGES OF THE INVENTION OVER PRIOR ART: _____

11. STATE AT LEAST ONE SPECIFIC UTILITY OF THE INVENTION: _____

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12. PERMISSIBLE VARIATIONS, ALTERNATIVES, OTHER COMMENTS: _____

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		Date	Signatures
Submitted by:	(1)		
	(2)		
	(3)		
	(4)		

Manager's Signature: _____

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